

**IN THE SPECIFICATION**

Please replace paragraph beginning on page 9, line 1 and ending on page 10, line 29 with the following paragraph.

Typically, the angle of arrival of a signal can be estimated from comparison of the sum beam 710 and difference beam 730. This procedure is known as monopulse angle estimation. The standard angle estimation procedure can be modified to estimate the angle-of-arrival of a colored noise signal. In Fig. 7, the signal processing performed by the signal processor 515 that follows the formation of the sum beam 710 and difference beam 730 is provided. From the antennas 610 and 620, the sum beam 710 is input to unit 718 that converts the sum beam 710 to a complex baseband. In one embodiment, the unit 718 is not provided and the sum beam 710 is provided directly to a delay unit 712 via the antennas 610 and 620. The output of the unit 718 is input to a delay unit 712. The output signal of the delay unit 712 is provided to a complex conjugator 714. In one embodiment, the complex conjugator 714 is used to negate the imaginary portion of the output signal from the delay unit 712. The output signal of the complex conjugator 714 is multiplied by the output signal from unit 718 (complex baseband converted sum beam 710) in a multiplier 716. The output signal of the multiplier 716 is provided to an integrator 720. The output signal of the integrator 720 is denoted  $\rho_s$  and is input to the monopulse processing module 750. From the antennas 610 and 620, the difference beam 730 is input to unit 738 that converts the difference beam 730 to a complex base band. In one embodiment, the unit 738 is not provided and the difference beam 730 is provided directly to a delay unit 732 via antenna 610 and 620. The output from the unit 738 is input to a delay unit 732. The output signal of the delay unit 732 is input to a complex conjugator 734. In one embodiment, the complex conjugator 734 is used to negate the imaginary portion of the output signal from the delay unit 732. The output signal from the complex conjugator 734 is multiplied by the ~~difference beam 730~~ complex baseband version of the sum beam 710 in a multiplier 736. The output signal from the multiplier

736 is provided to an integrator 740. The output signal from the integrator 740 is denoted  $\rho_{sd}$  and is input to the monopulse processing module 750. The monopulse processing module 750 calculates the angle of arrival,  $\beta$ , from the  $\rho_s$  signal and the  $\rho_{sd}$  signal corresponding to the lag or delay  $d$  specified in the delay units 712 and 732. The monopulse processing module 750 determines the angle of arrival,  $\beta$ , by calculating the ratio of  $\rho_{sd}$  to  $\rho_s$ . This ratio is an estimate of the ratio of the response of the difference beam 730 at the angle-of-arrival of the signal to the response of the sum beam 710 at the angle-of-arrival of the signal. This ratio can be converted to the angle-of-arrival estimate by a look-up table this is obtained from the specific sum beam 710 and difference beam 730 patterns that are produced by antennas 610 and 620 as combined by signal processor 515. Once  $\beta$  is determined, if the lag or delay  $d$  corresponds to the colored noise-like preamble, the monopulse processing unit 750 causes a high gain lobe of the antennas 610 and 620 to be steered in the direction of  $\beta$ . If the lag or delay  $d$  corresponds to the narrowband jamming process and/or narrow bandwidth interfering signal, the monopulse processing unit 750 causes an antenna pattern, such as, for example, a spatial null to be steered to the antennas 610, 620 in the direction of  $\beta$ . In one embodiment, since the interfering signals have a narrow bandwidth, the correlation function is periodic. Therefore, if the lag or delay  $d$  is a multiple of the period of the narrow bandwidth interfering signal, the angle-of-arrival of the interfering signal can be determined. Further, in one embodiment, the steering of the antennas 610 and 620 is provided by forming a weighted difference of first antenna output  $a_1(t)$  and second antenna output  $a_2(t)$  using the following equation:  $\text{Difference} = K_1 \cdot a_1(t) - K_2 \cdot a_2(t)$ . In one embodiment, a null will exist at angle  $\theta$  in the difference beam 730 when the ratio of  $K_1/K_2$  is equal to the ratio of  $b_2(\theta)/b_1(\theta)$  where  $b_1$  and  $b_2$  are the beam patterns of the antennas 610 and 620 at the temporal frequency of the interfering signal. When the interfering signal has a narrow bandwidth, the difference beam 730 could be used to receive a desired signal when nulling out the narrow bandwidth interfering signal. To steer antennas 610 and 620 having an antenna pattern with high gain lobes, such as, for

example, wideband, a time delay is used to compensate for the delay difference between the two elements. In one embodiment, one element would be delayed with respect to the other element so that the signals coming from the desired direction are added in-phase regardless of the frequency of the signals. It should be appreciated that this technique is a standard beamforming technique to one skilled in the art.